

Categorisation of activation waste from PPCS model power plants

R A Forrest, N P Taylor and R Pampin

*EURATOM/UKAEA Fusion Association,
Culham Science Centre, Abingdon, OX14 3DB, UK*

Abstract

As part of the Power Plant Conceptual Study (PPCS) Stage 3 programme (and its follow-up) work was carried out to calculate the categorisation of activated material from the PPCS plant models A, B, C, D and AB. This paper presents the methodology and results of this study.

The categorisation is based on the contact dose rate, the heat production and the Clearance index, with four categories of materials defined. These are Non Active Waste (NAW), Simple Recycle Material (SRM), Complex Recycle Material (CRM) and Permanent Disposal Waste (PDW). Data from the FISPACT-2003 activation calculations are presented at 50 and 100 years after shutdown, for all materials (including replacements) generated during the operation of the various power plants.

A series of conclusions can be drawn from these studies; the most important is that by 100 years after shutdown there is no need to permanently dispose of any material in a repository, it is feasible to recycle everything according to radiological criteria. Such a conclusion could be modified in the future based on economic or societal options, but the technical lack of any PDW is very significant.

Comparisons of the radio-toxicity of material from the various PPCS power plants with that from other methods of power generation have been made and confirm the very positive relative environmental impact of fusion shown by previous studies.